Attorney Docket No. 6197.214-US
Kanstrup et al.
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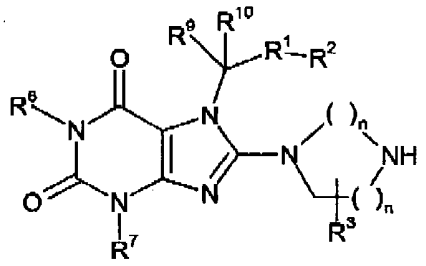
IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

CLAIM LISTING

1. **(Currently Amended)** A compound of formula I



I

wherein

each n is one or two independently

R^1 is C=O; C=S; C_1-C_2 alkyl optionally substituted with one or more R^4 independently; C_2 alkenyl substituted with one or more R^4 independently; C_2 alkynyl; C_3-C_7 cycloalkyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^4 independently; aryl optionally substituted with one or more R^4 independently; aryl C_1-C_3 alkyl optionally substituted with one or more R^4 independently; heteroaryl optionally substituted with one or more R^4 independently; heteroaryl C_1-C_3 alkyl optionally substituted with one or more R^4 independently; perhalo C_1-C_{10} alkyl; perhalo C_1-C_{10} alkyloxy;

R^2 is H; C_1-C_7 alkyl optionally substituted with one or more R^4 independently; C_2-C_7 alkenyl optionally substituted with one or more R^4 independently; C_2-C_7 alkynyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^4 independently; aryl optionally substituted with one or more R^4 independently; aryl C_1-C_3 alkyl optionally substituted with one or more R^4 independently; heteroaryl C_1-C_3 alkyl

optionally substituted with one or more R^4 independently; heteroaryl optionally substituted with one or more R^4 independently, -SH; -SR^5; SOR^5; SO_2R^5; -CHO; -$CH(OR^5)_2$; carboxy; -CO_2R^4; $NHCONNH_2$; -$NHCSNH_2$; -$NHCONH_2$; -$NHCOR^4$; -$NHSO_2R^5$; -O-CO-(C_1-C_5) alkyl optionally substituted with one or more R^4 independently; cyano; nitro; halogen; hydroxy; perhalo C_1-C_7 alkyl; perhalo C_1-C_7 alkyloxy; -SO_2NH_2; -$SO_2NH(R^5)$; -$SO_2(R^5)_2$; -$CONH_2$; -$CSNH_2$; -CON_2H_3; -$CONH(R^5)$; -$CON(R^5)_2$; C_1-C_{10} alkyloxy optionally substituted with R^4 independently; C_2-C_{10} alkenyloxy optionally substituted with R^4; C_2-C_{10} alkynyloxy optionally substituted with R^4 independently, aryloxy optionally substituted with R^4 independently; heteroaryloxy optionally substituted with R^4 independently;

R^3 is H; C_1-C_{10} alkyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkenyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkynyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^4 independently; aryl optionally substituted with one or more R^4 independently; aryl C_1-C_3 alkyl optionally substituted with one or more R^4 independently; heteroaryl C_1-C_3 alkyl optionally substituted with one or more R^4 independently; heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$NH(CH_2)_{1-4}$NH-aryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$NH(CH_2)_{1-4}$NH-heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$O(CH_2)_{1-4}$NH-aryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$O(CH_2)_{1-4}$NH-heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$O(CH_2)_{1-4}$O-aryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$O(CH_2)_{1-4}$O-heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$S(CH_2)_{1-4}$NH-aryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$S(CH_2)_{1-4}$NH-heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$S(CH_2)_{1-4}$S-aryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-$S(CH_2)_{1-4}$S-heteroaryl optionally substituted with one or more R^4 independently; C_1-C_{10} alkyl-O-C_1-C_5alkyl optionally substituted with one or more R^4; -$NHCOR^4$; -$NHSO_2R^5$; -O-CO-(C_1-C_5) alkyl optionally substituted with one or more R^4 independently; -SH; -SR^5; -SOR^5; -SO_2R^5; -CHO; -$CH(OR^5)_2$; carboxy; cyano; nitro; halogen; hydroxy; -SO_2NH_2; -$SO_2NH(R^5)$;

$-SO_2N(R^5)_2$; $-CONH_2$; $-CONH(R^5)$; $-CON(R^5)_2$; $-CSNH_2$; $-CONHNH_2$; $-CO_2R^4$; $-NHCNHNH_2$; $-NHCSNH_2$; $-NHCONH_2$;

R^4 is C_1-C_{10} alkyl optionally substituted with one or more R^8 independently; C_2-C_{10} alkenyl optionally substituted with one or more R^8 independently; C_2-C_{10} alkynyl optionally substituted with one or more R^8 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^8 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^8 independently; aryl optionally substituted with one or more R^8 independently; heteroaryl optionally substituted with one or more R^8 independently; amino; amino substituted with one or more C_1-C_{10} alkyl optionally substituted with one or more R^8; amino substituted with one or two aryl optionally substituted with one or more R^8 independently; heteroaryl optionally substituted with one or more R^8 independently; =O; =S; -CO-**R^5**~~**R5**~~; -COO**R^5**~~**R5**~~; -O-CO-(C_1-C_5) alkyl optionally substituted with one or more R^8 independently; $NH(CH_2)_{1-4}$NH-aryl; $NH(CH_2)_{1-4}$NH-heteroaryl; $-NHCOR^5$; $-SOR^5$; SO_2R^5; carboxy; cyano; N-hydroxyimino; nitro; halogen; hydroxy; perhalo C_1-C_{10} alkyl; perhalo C_1-C_{10} alkyloxy; -SH; $-SR^5$; $-SO_3H$; $-SO_3R^5$; $-SO_2R^5$; $-SO_2NH_2$; $-SO_2NH(R^5)$; $-SO_2N(R^5)_2$; $-CONH_2$; $-CONH(R^5)$; $-CON(R^5)_2$; C_1-C_{10} alkyloxy optionally substituted with one or more R^8 independently; C_2-C_{10} alkenyloxy optionally substituted with one or more R^8 independently; C_2-C_{10} alkynyloxy optionally substituted with one or more R^8 independently; aryloxy optionally substituted with one or more R^8 independently; heteroaryloxy optionally substituted with one or more R^8 independently;
and **when** two R^4 **are** attached to the same carbon atom**, they, together with the carbon atom,** may form a spiroheterocyclic system**[, preferably] selected from** hydantoin; thiohydantoin; **and** oxazolidine-2,5-dione;

R^5 is C_1-C_{10} alkyl optionally substituted with one or more R^8 independently; C_2-C_{10} alkenyl optionally substituted with one or more R^8 independently; C_2-C_{10} alkynyl optionally substituted with one or more R^8 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^8 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^8 independently; aryl optionally substituted with one or more R^8 independently; aryl C_1-C_5 alkyl optionally substituted with one or more R^8 independently; heteroaryl optionally

substituted with one or more R^8 independently; heteroaryl C_1-C_5 alkyl optionally substituted with one or more R^8 independently;

R^6 is H; C_1-C_{10} alkyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkenyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkynyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^4 independently; aryl optionally substituted with one or more R^4 independently; heteroaryl optionally substituted with one or more R^4 independently;

R^7 is H; C_1-C_{10} alkyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkenyl optionally substituted with one or more R^4 independently; C_2-C_{10} alkynyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloalkyl optionally substituted with one or more R^4 independently; C_3-C_7 cycloheteroalkyl optionally substituted with one or more R^4 independently; aryl optionally substituted with one or more R^4 independently; heteroaryl optionally substituted with one or more R^4 independently;

R^8 is H, amidoxime; nitro, tetrazole; pentafluorophenyl; $-CH_2OH$; -CHO; $-C\underline{H}(OCH_3)_2$; $-COCH_3$; $-CF_3$; $-CCl_3$; $-OCF_3$; $-OCH_3$; -CN; ~~$-CO_2H$~~; $-CO_2CH_3$; $-CONH_2$; $-CSNH_2$; $-CON_2H_3$; $-SO_3H$; $-SO_2NH_2$; $-SO_2NHCH_3$; $-SO_2N(CH_3)_2$; $-SO_2$ (1-piperazinyl); $-SO_2$ (4-methylpiperazin-1-yl); $-SO_2$ (pyrrolidin-1-yl); $-SO_2$ (piperidin-1-yl); $-SO_2$ (morpholin-4-yl); N-hydroxyimino; $-NH_2$; $-NHCH_3$; $-N(CH_3)_2$; $-NHCNHNH_2$; $-NHCNHNHCH_3$; $-NHCSNH_2$; $-NHCSNHCH_3$; $-NHCONH_2$; $-NHCONHCH_3$; $-NHCOCH_3$; $-NHSO_2CH_3$; piperazinyl; morh~~a~~pholin-4-yl; thiomorpholin-4-yl; pyrrolidin-1-yl; piperidin-1-yl; halogen; -OH; -SH; $-SCH_3$; -aminoacetyl; ~~$-OPO_3H_2$~~; $\underline{-OPO_3H_2}$; ~~$-OPO_3OCH_3$~~; $\underline{OPO(OH)(OCH_3)}$; $-PO_3H_2$; $-PO(OCH_3)_2$; $PO(OH)(OCH_3)$;

R^9 is H; halogen; C_1-C_{10} alkyl optionally substituted with one or more R^4 independently

R^{10} is H; halogen;

or, R^9 and R^{10}, **together with the carbon atom to which they are attached,** may be connected to form a cyclopropyl ring;

or a salt thereof with a pharmaceutically acceptable acid or base;

with the exception of the following compounds:

7-(3-Chloro-propyl)-1,3-dimethyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione;

7-(3-Amino-propyl)-1,3-dimethyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione;

3-(1,3-Dimethyl-2,6-dioxo-8-piperazin-1-yl-1,2,3,6-tetrahydro-purin-7-yl)-propionaldehyde;

1,3-dimethyl-7-(2-oxo-propyl) -8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

1,3,1',3',7'-pentamethyl-8-piperazin-1-yl-3,7,3',7'-tetrahydro-7,8'-methanediyl-bis-purine-2,6-dione,

~~**3,4,5-trimethoxy-benzoic acid 2-(1,3-dimethyl-2,6-dioxo-8-piperazin-1-yl-1,2,3,6-tetrahydro-purin-7-yl)- ethyl ester,**~~

7-[2-Hydroxy-3-(4-methoxy-phenoxy) -propyl]-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-[2-hydroxy-2-(4-nitro-phenyl) -ethyl]-3-methyl-8-piperazin-1-yl-3,7,8,9-tetrahydro-purine-2,6-dione,

7-Benzyl-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-(4-Chloro-benzyl) -3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-(2-Chloro-benzyl) -3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-Ethyl-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

3-Methyl-8-piperazin-1-yl-1,7-dipropyl-3,7-dihydro-purine-2,6-dione,

3-Methyl-7-(3-methyl-butyl) -8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-Butyl-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

3-Methyl-7-(3-phenyl-propyl) -8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-But-2-enyl-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-(3-Chloro-but-2-enyl) -3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

7-Heptyl-3-methyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

3-Methyl-7-(1-phenyl-ethyl) -8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

3-Methyl-7-(3-methyl-benzyl) -8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione,

3-Methyl-7-propyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione, and

3-Methyl-7-pentyl-8-piperazin-1-yl-3,7-dihydro-purine-2,6-dione.

2. (Original) A pharmaceutical composition comprising at least one compound according to claim 1 together with a pharmaceutically acceptable carrier or diluent.